

WHAT IS CLAIMED IS:

1. A hybrid electric vehicle comprising:

an accelerator pedal;

an engine consuming fuel in order to output a rotating torque;

a first motor connected to the engine, the first motor generating electric power in response to the rotating torque of the engine while generating a rotating torque to accelerate the engine in response to power supply;

a second motor generating a drive torque for the vehicle in response to power supply;

a power storage device connected electrically with the first motor and the second motor, the power storage device supplying power to the first motor and the second motor while accumulating power generated by the first motor;

a sensor detecting a depression amount of the accelerator pedal;

a sensor detecting a rotation speed of the engine; and

a programmable controller programmed to:

set a target drive torque for the vehicle in response to the depression amount of the accelerator pedal;

supply power corresponding to the target drive torque to the second motor from the power storage device;

calculate an available power supply amount to the first motor by subtracting a power supply amount to the second motor from an available output power of the power storage device;

calculate a target rotation speed of the engine based on the target drive torque; and

supply power to the first motor from the power storage device within a range which does not exceed the available power supply amount to the first motor, when the available power supply amount to the first motor is a positive value and the target rotation speed of the engine exceeds the rotation speed of the engine.

2. The hybrid electric vehicle as defined in Claim 1, wherein the controller is further programmed to calculate a target output torque of the second motor based on the target drive torque, and to control the operation of the second motor so that an electric power corresponding to the target output torque is consumed.

3. The hybrid electric vehicle as defined in Claim 1, wherein the hybrid vehicle further comprises a sensor which detects a vehicle speed, and the controller is further programmed to calculate a target drive force for the vehicle from the target drive torque and the vehicle speed, and to control a power generation amount of the first motor in response to a difference between an electric power corresponding to the target drive force and the available output power of the power storage device when the power corresponding to the target drive force exceeds the available output power of the power storage device.

4. The hybrid electric vehicle as defined in Claim 3, wherein the controller is further programmed to calculate a provisional power generation amount of the first motor from the electric power corresponding to the target drive force, and to control the power generation amount of the first motor according to whichever larger between a difference of the electric power corresponding to the target drive force and the available power of the power storage device, and the provisional

power generation amount.

5. The hybrid electric vehicle as defined in Claim 1, wherein the controller is further programmed to limit an upper limit of a variation rate of the target drive force.

6. The hybrid electric vehicle as defined in Claim 1, wherein the hybrid electric vehicle is a parallel hybrid electric vehicle in which an output shaft of the engine, a first motor and a second motor are mechanically connected with each other through a differential gear mechanism.

7. The hybrid electric vehicle as defined in Claim 6, wherein the differential gear mechanism comprises a planetary gear set having a sun gear connected to the first motor, a ring gear connected to the second motor and a carrier connected to the output shaft of the engine.

8. The hybrid electric vehicle as defined in Claim 7, wherein the controller is further programmed to calculate a vehicle drive torque output from the engine via the planetary gear set, to calculate a target supply power to the second motor based on a torque obtained by deducting the vehicle drive torque output from the engine from the target drive torque for the vehicle, and to control a power generation amount of the first motor in response to a difference between the target supply power to the second motor and the available output power of the power storage device when the target supply power to the second motor exceeds the available output power of the power storage device.

9. A hybrid electric vehicle comprising:

an accelerator pedal;

an engine consuming fuel in order to output a rotating torque;

a first motor connected to the engine, the first motor generating electric power in response to the rotating torque of the engine while generating a rotating torque to accelerate the engine in response to power supply;

a second motor generating a drive torque for the vehicle in response to power supply;

a power storage device connected electrically with the first motor and the second motor, the power storage device supplying power to the first motor and the second motor while accumulating power generated by the first motor;

means for determining a depression amount of the accelerator pedal;

means for determining a rotation speed of the engine;

means for setting a target drive torque for the vehicle in response to the depression amount of the accelerator pedal;

means for supplying power corresponding to the target drive torque to the second motor from the power storage device;

means for calculating an available power supply amount to the first motor by subtracting a power supply amount to the second motor from an available output power of the power storage device;

means for calculating a target rotation speed of the engine based on the target drive torque; and

means for supplying power to the first motor from the power storage device within a range which does not exceed the available power supply amount to the

first motor, when the available power supply amount to the first motor is a positive value and the target rotation speed of the engine exceeds the rotation speed of the engine.

10. A control method for a hybrid electric vehicle, the hybrid electric vehicle comprising an accelerator pedal, an engine consuming fuel in order to output a rotating torque, a first motor connected to the engine, the first motor generating electric power in response to the rotating torque of the engine while generating a rotating torque to accelerate the engine in response to power supply, a second motor generating a drive torque for the vehicle in response to power supply, and a power storage device connected electrically with the first motor and the second motor, the power storage device supplying power to the first motor and the second motor while accumulating power generated by the first motor, the method comprising:

- determining a depression amount of the accelerator pedal;

- determining a rotation speed of the engine;

- setting a target drive torque for the vehicle in response to the depression amount of the accelerator pedal;

- supplying power corresponding to the target drive torque to the second motor from the power storage device;

- calculating an available power supply amount to the first motor by subtracting a power supply amount to the second motor from an available output power of the power storage device;

- calculating a target rotation speed of the engine based on the target drive torque; and

- supplying power to the first motor from the power storage device within a

range which does not exceed the available power supply amount to the first motor, when the available power supply amount to the first motor is a positive value and the target rotation speed of the engine exceeds the rotation speed of the engine.